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Conclusion.—We have considered the only two arguments which are advanced nowadays to prove that the fundamental entities and relations dealt with by geometry are not given perceptually, but are some sort of “constructs.” We have found that each argument ends in a *reductio ad absurdum* wherein the very subject of inquiry itself is denied. We have not investigated the status of all geometrical entities; but we have shown that, at least in the case of the straight line, the arguments against its perceptual existence are untenable. It is highly probable that the same might be shown with respect to several other entities, such as the circle, the triangle, the ellipse. At the same time, it is quite obvious that many other geometrical entities are imperceptible, such as the sine of an angle, or the dense series. It seems pretty safe to conclude, then, that we perceive exactly what we perceive; that when we see a line as absolutely straight, we see an absolutely straight line. And the status of what we see is in no manner changed either (1) by the fact that, from another point of view and with other instruments and other observers, it may exhibit another quality; or (2) by the fact that it does not exhibit all of its implicates. Both the qualities of other points of view and also the analytically discovered implicates are merely *added* characters, not nullifying forces. If this is true, then we must return to the natural and naïve opinion that *we directly perceive a number of geometrical entities; that these entities are not “ideal constructs” at all; that they are not constituted by their implicates; and finally that whether we can or can not perceive a geometrical entity depends upon the character of the particular entity in question, upon the angle of observation which we can take toward it, and upon the power of our perceiving organs.* In short, the problem of perceiving such a one differs not at all from the problem of seeing a molecule.

WALTER B. PITKIN

COLUMBIA UNIVERSITY.

CONTENT VERSUS “KUNDGABE” IN INTROSPECTION

PERHAPS the strongest charge which has been brought against the investigators who claim to have discovered “imageless thoughts” in introspective reports, is to the effect that no description of these new contents has, as yet, been secured. The criticisms of v. Aster¹ and Dürr² on Bühler’s results bear upon this point, and since Dürr was one of the two observers upon whom Bühler relied

¹ *Zsch. f. Psychol.*, 1908, 49, page 69.

² *Zsch. f. Psychol.*, 1908, 49, page 315.

most extensively for his data, the charge has acquired added weight. Titchener, who has reviewed the evidence in detail,³ is of the same opinion, to wit, that instead of describing imageless contents, the observers in these experiments merely communicated information about that which they had experienced, the real content of the experience having eluded them.

Titchener further upholds Jacobson's results⁴ which aim to show that there are no specific "meaning processes" which underlie the informational statements of meaning, and maintains, on the basis of his own investigations, that the "attitudes implied in, or demanded by, the two modes of report . . . turn out to be, the one, that of descriptive psychology, the other, that of logic or of logical common sense."⁵

Investigations which I have made on the consciousness of meaning have revealed such a striking difference in the attitudes and results obtained from two different types of problem, that it has seemed to me worth while to report the fact briefly.

When I began my investigations in the fall of 1909, I had at my disposal only untrained observers. I wished to repeat some of Bühler's experiments, but realizing the unusual demands upon introspective ability involved in his method of introspecting the meanings of aphorisms, I decided to begin my investigations with the simpler problem of introspecting the meanings of words. Only after four such series of 50-100 words each had been performed, did I venture to study the consciousness evoked by aphorisms and simple logical problems.

In working up my results, I made use of a statistical method, classifying the data of each report in accordance with certain familiar categories. The main groups which proved adequate for the experiments with word-stimuli were the following: (1) Concrete imagery: visual, auditory, kinesthetic, and miscellaneous. Here were classed all concrete images, including bodily sensations. (2) Verbal imagery: visual, auditory, kinesthetic, and miscellaneous,—the latter group embracing instances in which the imagery was mixed or inexactly identified. Some sensational factors were also attributed to this class. (3) Affection: feelings of satisfaction or dissatisfaction, amusement, familiarity, and the like, although it may be noted in passing that many of these instances appeared to be judgmental rather than truly affectional in nature. (4) Notions: imageless contents, embracing both concrete and abstract data which were

³ "Experimental Psychology of the Thought-Processes," 1909, pages 145 ff., also *Am. Journ. of Psychol.*, 1912, 23, page 165.

⁴ *Am. Journ. of Psychol.*, 1911, 22, page 553.

⁵ *Loc. cit.*, *Am. Journal of Psychol.*, page 182.

declared to be as definitely present as were the elements of the other categories, but in which no imaginal or affectional characteristics were evident.

When I proceeded to treat the reports secured with aphorisms and other statements involving a more extended thought-process, I was surprised to find that my method was inapplicable. Very rarely was an image reported, and no longer were the notions described as contents, which could be differentiated from images and affections. The introspection appeared to be directed, not upon the content of the experience, but upon the process and the relationships which were involved.

For the purpose of this article I have selected results from two of my series which are as nearly comparable as possible, in order to indicate this difference. Series III. was the third series of experiments performed. It included 100 words, 40 of which were repeated from previous experiments and are here eliminated. Observer A performed but half of the series, while observer O., who used a different series of words, performed 32 "originals" and 16 "repeats."* Series V. followed series III. after an intervening series in which the reaction-time was primarily the object of study. Series V. experimented with aphorisms, the set used by observer O. being again different from that used by the other three observers. Both words and aphorisms were given orally by the experimenter, the observer being instructed to secure the meaning and react by uttering the word "yes" (or "no," in the case of aphorisms where disagreement was to be indicated). Since the method used in series V. was altered during the course of the series to adopt a visual form of exposure, it happens that the number of experiments here reported differs for each observer.

The time of reaction was measured with a stop-watch. The results are indicated in the following table:

TABLE I

Obs.	Series III.				Series V.			
	Number	Arith. av.	Median	Mv.	Number	Arith. av.	Median	Mv.
A.	30	5.74"	5.4"	1.36	20	12.88"	11.0"	4.42
D.	60	1.31	1.2	0.182	41	7.14	6.6	1.97
V.	57	1.72	1.8	0.215	27	6.82	6.4	1.56
O.	32	5.09	4.6	1.586	32	17.9	15.2	6.42

It will be noted that the reaction-time of series V. was much longer and less uniform than that of series III. This, of course, re-

*The observers of these two series were the following persons: A., Mr. W. S. Adkins, a senior student; D., Mr. F. A. Davis, a junior student; V., Miss Sabra Vought, the university librarian, and O., the writer.

quires no special comment. The fact that in series III. the observers were instructed to "be in no hurry to react," may account in part for the lengthened time of observers A. and O., as compared with that of observers D. and V., though it was also evident that the first two observers were of a more deliberate type than the latter two.

The results of the statistical inquiry into the reports of the two series are given in the following table:

TABLE II

		Series III. Obs. A. 30 ex- periments		Series V. 20 experiments		Series III. Obs. D. 60 ex- periments		Series V. 41 experiments	
		No.	%	No.	%	No.	%	No.	%
Concrete imagery	vis.....	14	46.6	2	10	9	15	1	2.4
	aud.....	2	6.6	—	—	1	1.6	—	—
	kin.....	2	6.6	—	—	3	5	—	—
	misc.....	—	—	2	10	3	5	—	—
Total.....		18	60.0	3	15	16	26.6	1	2.4
Verbal imagery	vis.....	5	16.6	—	—	21	35	1	2.4
	aud.....	—	—	—	—	2	3.3	—	—
	kin.....	4	13.3	—	—	4	6.6	—	—
	misc.....	1	3.3	8	40	29	48.3	1	2.4
Total.....		10	33.3	8	40	56	93.3	2	4.8
Affections.....		13	43.3	6	30	6	10	1	2.4
Notions.....		29	96.6	20	100	55	91.6	41	100

		Obs. V. 60 ex- periments		27 experiments		Obs. O. 32 ex- periments		31 experiments	
		No.	%	No.	%	No.	%	No.	%
Concrete imagery	vis.....	25	41.6	3	11.1	11	34.3	4	12.9
	aud.....	1	1.6	—	—	—	—	—	—
	kin.....	5	8.3	—	—	2	6.2	—	—
	misc.....	—	—	—	—	2	6.2	—	—
Total.....		30	50	3	11.1	15	46.8	4	12.9
Verbal imagery	vis.....	14	23.3	1	3.7	11	34.3	3	9.6
	aud.....	1	1.6	—	—	—	—	2	6.4
	kin.....	1	1.6	—	—	2	6.2	—	—
	misc.....	2	3.2	1	3.7	1	3.1	3	9.6
Total.....		18	30	2	7.4	14	43.7	8	25.8
Affections.....		4	6.6	3	11.1	7	21.8	4	12.9
Notions.....		48	80	27	100	31	96.8	31	100

(The "totals" of concrete and verbal imagery refer to the number of different experiments in which the imagery occurred.)

Here are indicated the total number of experiments, and the number and percentage of appearances of each of the elements described above. It will be noted that despite the individual variations, which are striking, the presence of imagery, both concrete and verbal, in series III. was very frequent for all observers. Affection occurred

less often, while notions were the most invariable contents, except in the case of observer D. who reported verbal imagery more often. We may add that the instances in which imagery and affection appeared to make up the complete content of the experience were, in number, one for observer A., five for observer D., twelve for observer V., and one for observer O. The instances in which only notions were reported were, in number, four for observer A., fifteen for observer D., twenty-one for observer V., and one for observer O.

It is not the purpose of this paper to enter into a more detailed discussion of the grounds upon which notions may be distinguished from imagery and affection, but merely to emphasize the fact that in reports such as these, where description of content is decidedly the rule, the best of evidence should be procurable for such a distinction.

The results of the same method of analysis as applied to series V. are a striking demonstration that here description was *not* the rule. Only in the case of affections do we find percentages of appearance which approach at all nearly to the percentages of series III. Verbal imagery for observer A. is slightly in excess of that found in the earlier series, but every other result for imagery is relatively negligible. As for the appearance of notions, the ascription of 100 per cent. in each instance is purely inferential.

In making this comparison, it should be borne in mind that series V. was performed by the same observers who had previously demonstrated their ability to describe psychologically in each of the four series with word-stimuli. The fact that they did not use this method in series V. indicates the fundamental difference in the attitudes which prevailed in the two series. From this I conclude that the method of studying the thought-process by the arousal of complicated experiences is unsuited to a description of content. The simpler method of arousing a brief consciousness of meaning with reference to a single object or word, however, seems from these results to be a very adequate means for procuring an analysis of content. A further series of experiments which I performed with two of these observers, A. and D., exposing the stimulus-words with a card-changer and measuring the reaction-time by a chronoscope, resulted in a reduction of the average time to 1.1" and .8", respectively, without any corresponding diminution in the content of the experiences, or in the observer's ability to analyze it. This, we may note in passing, accords well with the results obtained by Hillgruber, and reported by Ach,⁷ to the effect that more efficient intellectual work may be secured under the stress of a quick reaction, than when the observer selects his own time for the procedure.

It may not be concluded, however, that thought-experiments of the

⁷ *Zsch. f. Päd. Psychol. u. Exp. Päd.*, 1913, 14, page 1.

Bühler type have no scientific value. On the contrary, the results secured, even with such comparatively untrained observers as were here engaged, indicate many important facts regarding the course of thinking and the nature of the relations involved in the thought-process. What we have not secured from them in the experiments at hand is an adequate description of the content which was experienced.

In order to make the distinction between these two types of report more clear, and at the same time to indicate their respective values as scientific data, I have selected for further consideration two parallel reports of each observer, one from series III. and one from series V.:

Observer A., III., 15, *Sale*, 8.6".—First, the noun, sail, on ships, to catch the wind—used on small boats. Second, thought reference to the church hymn: "We'll sail the wide seas,"—seemed rather amusing. Third, image of some sort of small boat, possibly a picture of a yacht—white sails. Conscious of the act of sailing, impression that the boat was going from right to left across the field. Also conscious of the part of the yacht which is below the water.

Secondary introspection:⁸ Can't base the amusement; due, probably, to a general habit or attitude. Just at last, thought of it as a verb. No reference to *sale*. The duration seemed longer.

This report indicates three principal moments. It is not purely descriptive, but description is clearly in evidence. The notion of something-on-ships-to-catch-the-wind is the characteristic of the first moment, and it appears to have been imageless. The second moment was probably verbal and affectional. The third was imaginal, though not entirely so, for the act of sailing and a sense of direction were involved. The reference to the portion of the boat below the water-line is also notional. The fact that "small boat" occurs in both the first and third moments, indicates the probability of a relation which was not entirely disrupted by the irrelevant second moment. It also calls in question the exact line of demarcation between the first and third moments. They appear to have become somewhat mixed in the introspection.

Observer A. V., 7, "How fruitful is modern philosophy, for she is constantly coining new terms," 11.8".—After, or during, the first part I seemed to go to work on it. As a basis I had a very general view of the schools of modern philosophy beginning with Kant—references to Hegel and Fichte, and general reference to all modern philosophies. Even then I did not see the object of such a statement (regarding) just the first part. I doubted if it would come in this class. All thought was cut off by the second part, but there were still tendencies to refer back—an attitude. Disturbed by the intention to be funny. I knew it was funny, but it did not strike me. Just at last came the thought that modern philosophy is fruitful, but not because it coins so many terms.

Secondary introspection: Tendency to deny what the statement implied.

⁸ The secondary introspection was drawn out by questions of the experimenter.

This report does not reveal specific notions or images, but there is an indication of the thinking-process involved in the abrupt disjunction of the first and second parts of the statement, and the tendencies to relate the second back to the first. The complex "thought" of the schools of modern philosophy which attached to the first part, and the disturbance due to the "intention to be funny" which the second part introduced, are characteristic of the mental work which was accomplished. The whole culminates in a judgment which cuts the Gordian knot in its failure, or refusal, to take cognizance of the irony which was implied. As to the nature of the images or simple notions which may have been present, we have no evidence.

Observer D., III., 93, *Elk*, 0.8".—Familiarity with the word. Visual image of the word, then of a pair of antlers. I thought I knew what the meaning of the word as attached to antlers was. Thought of an Elk as a member of that lodge—tendency to look in that direction. Recalled a person who is an Elk. No image.

Here the central feature of report is two visual images. The thought that "I knew what the meaning of the word as attached to antlers was" may have been merely a feeling of familiarity. The thought-of-an-Elk-as-a-member-of-that-lodge appears to be a notion which provoked the tendency to look in the direction of the local Elk's lodge, and associated another notion of a person who was an Elk. The fact that this last combination of notions and direction-tendency were reported without imagery is significant, since the first appearing facts were images.

Observer D., V., 24, "Beware of the man whose God is in the skies," 5.4".—Many associations attributable to reading. I did not see the meaning at first. Then it occurred: Beware of such a man because such a God has not much to do with his life. Then reference to a man whose religion and morality are separate. Associated at the time of reaction a remembrance of reading somewhere: If a man comes to your house and tells you he sees no distinction between virtue and vice, put your spoons away.

Secondary introspection.—There was a reference to the Greeks as having their religion and morality separate. This was condemned offhand, because I had considered it in the past as a result of class discussion and reading. Morality and religion are not necessarily the same, but they go hand-in-hand.

Here again we have largely "Kundgabe," rather than content. We can see, however, that the meaning was mainly attributable to associative references which were familiar, and more or less explicitly reproduced. As to the nature of this reproduced content, again, there is no evidence.

Observer V., III., 44, *Stole*, 1.8".—First, the verb, something taken, not clearly carried out, but recognized as theft. Second, as applied to the garments of the clergy. Vague image of a clergyman in his robes. It might have been Mr. W—, a tall man in a green stole. The green stole is the one used at this season of the year. This fact was recognized.

The contents here are primarily two, the first notional, the second imaginal. It is not impossible that the notion may have had a verbal vehicle. The recognition that "the green stole is the one used at this season of the year" is, perhaps, more evidentially notional, though even here it might be contended that a feeling of familiarity and appropriateness would exhaust the actual content of the experience.

Observer V., V., 22, "Decency is indecency's conspiracy of silence," 12".—I take it to mean that indecency affects decency to cover up its own defects. Do not quite understand what conspiracy of silence. A show of decency will cover up indecency. There came the thought: "A prude is a female going about looking for temptations to resist."

Secondary introspection: It seemed a rather clever putting of words.

The understanding of this statement was apparently assisted by the revival of an analogous "thought." There is also indicated the stumbling-block which "conspiracy of silence" provoked. This was evidently not clearly worked out. There was an impression that the statement was apt and clever, without a full understanding of its meaning. The evidence as to content is again lacking.

Observer O., III., 44, *Ghost*, 4.6".—Clear consciousness of spelling, *gh* prominent. Word visualized as if lettered by hand. Reference to one of my extension lectures on "Ghost Hunting." It seemed as if many associations or thoughts might develop here, but none was indicated. Association with Palladino, and reproduction of her picture in the *New York Times*, Sunday. Came back to word. Thoughts and images of the ghost-hands in Palladino's séances.

We have here three moments. The first was a visual verbal image. The second reference was apparently notional, though it may have been verbal. An expectancy which it evoked failed to be realized. The last moment is confused, but involves a definite visual image.

Observer O., V., 21, "The final aim of science is concrete prevision," 13.6".—Understood immediately as being able to predict things. Question: Why *concrete*? Without much interruption, it became indicated that science was not a generalization or speculation; that, given certain materials, the aim of science was to tell what would happen to them when you put them together.

First we have an indication of general understanding which is, however, arrested by the use of the word "concrete." This led to a further process which eventuated in a more complete understanding. No descriptive contents are indicated.

It may be concluded that these parallel cases show markedly different attitudes and results. The reports of series III. aim to be descriptive, and in large measure achieve this aim. Those of series V. are informational, and deal with complex thoughts without detailed analysis. Both have their scientific value, for while the first method secures a description of content, it fails by its simplicity to

provoke any sustained thinking. The second method secures such thinking, and gives evidence as to thought-relations and their dependence upon associations, but it fails to describe the contents involved. In short, the one method complements the other. Of course, it is not impossible that more expert observers might also secure a description of content with the second method, yet the difference in attitude is apparently so profound that we should perhaps do well to rest our analyses of content for the present upon those briefer moments which can be more adequately inspected.

R. M. OGDEN.

UNIVERSITY OF TENNESSEE.

DISCUSSION

CAN SCIENCE SPEAK THE DECISIVE WORD IN THEOLOGY?—A REJOINDER

IN a recent article, under the above title, Dr. Cooley¹ takes issue with a thesis I maintained in a paper read at the last session of the American Philosophical Association. In his own words, my thesis is that "Psychology is competent to reach trustworthy *scientific* conclusions regarding the *objects* of theological inquiry."

It is essential to the understanding of the present discussion that "objects" of theological inquiry should be taken to mean not the Absolute of the metaphysicians, but *the Gods of the historical religions*, i. e., persons in direct anthropopathic communication with men. That is the sense I gave to that word in my paper. The God meant and addressed in the Christian prayerbooks of every denomination, as well as the gods of the barbarians, are of another species than the God of the Gifford lecturer. Any one in doubt regarding this difference need only ask himself what would remain of our church practises and of our Christian dogmas were they intended for our philosophers. How instructive would be a Christian book of common worship, prepared by and for those distinguished metaphysicians who are looked upon, with or without their consent, as champions either of the Christian religion, or of religion pure and *undefined*!

Dr. Cooley's argument runs thus: Religious experiences are "essentially secret and private"; they have in each case but one observer, and so but one reporter. They are facts, but not facts the observation of which is open to correction through the common inspection of many

¹ This JOURNAL, Vol. X., page 296.